

Work Order ID 138594

Tuesday, November 03, 2015 11:47:38 AM

138594

Page 1

Item ID: D4857-M

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Wiper Deflector

Start Date: 11/3/2015 Start Qty: 4.00

4

Cust Item ID:

Required Date: 11/3/2015 Req'd Qty: 4.00

4

Customer:

Reference:

Approvals: Process Plan: MCS Date: NOV 03 2015

Tooling:

Date:

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____

Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D4857

F

100

0.00

100

Purchasing

Memo

0.00

Purchasing

Issue P/O: 30359

Possible supplier: CARBON BY DESIGN

Manufacture as per dwg D4857-M

Prime Deflector as per dwg (SEE NOTE 4)

Certificate of Conformity release note is required.

CXNOV 04 20154

110

Receive & Inspect for Damage & Mat'l Certs

0.00

110

Packaging

Memo

0.00

Packaging

4X Sp 15-11-26

DQA:

Date:

15/12/04



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed:

Date:

15/12/04

Work Order update only ☐

Work Order: <u>138594</u> Part No. <u>DY857-M</u> NCR No. <u>15-5484</u>		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☒ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube ☐</td> <td>Cross tube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☒</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☒																																															
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Date: <u>15-11-26</u>		Step #: <u>100</u>		QTY Effective: <u>2</u>		MRB (QSI042) Approval DAS 9 9-89 <u>15-11-26</u>																																																																	
Description Work Order Deviation found 2 parts with marks on it but # acceptable DAS 9 9-89 RC. Supplier				Disposition Use-as-is cosmetic.		Completed By DAS 38 9-89 <u>NOV 26 2015</u> Lead hand / Supervisor Approval Verification DAS 9 9-89 <u>15-11-26</u> QC / QA Coordinator Approval DAS 9 9-89 <u>15-11-26</u>																																																																	
Root Cause <table style="width:100%;"> <tr> <td>Environment ☐</td> <td>No Re-verification ☐</td> </tr> <tr> <td>Design ☐</td> <td>Operator ☐</td> </tr> <tr> <td>Doc/Data ☐</td> <td>Offset/Setup ☐</td> </tr> <tr> <td>Equip/Tooling ☐</td> <td>Supplier ☒</td> </tr> <tr> <td>Handling/Pre ☐</td> <td>Training ☐</td> </tr> <tr> <td>Material ☐</td> <td>Use for Testing ☐</td> </tr> <tr> <td>Internal Transport ☐</td> <td>Poor Information ☐</td> </tr> <tr> <td>Tribal Knowledge ☐</td> <td>Rushing ☐</td> </tr> <tr> <td>LOA ☐</td> <td>Product Improvement ☐</td> </tr> <tr> <td>Substation ☐</td> <td>Process Improvement ☐</td> </tr> <tr> <td>Past Expiry Date ☐</td> <td>Manufacturing Process ☐</td> </tr> <tr> <td>Misidentified ☐</td> <td>Past Due ☐</td> </tr> </table>				Environment ☐	No Re-verification ☐	Design ☐	Operator ☐	Doc/Data ☐	Offset/Setup ☐	Equip/Tooling ☐	Supplier ☒	Handling/Pre ☐	Training ☐	Material ☐	Use for Testing ☐	Internal Transport ☐	Poor Information ☐	Tribal Knowledge ☐	Rushing ☐	LOA ☐	Product Improvement ☐	Substation ☐	Process Improvement ☐	Past Expiry Date ☐	Manufacturing Process ☐	Misidentified ☐	Past Due ☐	FAULT CATEGORY <table style="width:100%;"> <tr> <td>Pressure/Forced ☐</td> <td>Temperature/Cure ☐</td> <td>Power Loss/Surge ☐</td> <td>Positioned Wrong ☐</td> </tr> <tr> <td>Bending ☐</td> <td>Set-up ☐</td> <td>Folio/Program ☐</td> <td>Outside Dimensions ☐</td> </tr> <tr> <td>Centre Not Concentric ☐</td> <td>BOM/Route ☐</td> <td>Grain ☐</td> <td>Over/Under tolerance ☐</td> </tr> <tr> <td>Cracks ☐</td> <td>Broken/Damage/Defect ☐</td> <td>Weld ☐</td> <td>Part Incorrect ☐</td> </tr> <tr> <td>Crimp/Kink/Ripple/Wave ☐</td> <td>Inspection Incomplete/Unqualified ☐</td> <td>Wrong Stock Pulled ☐</td> <td>Part Lost/Missing ☐</td> </tr> <tr> <td>Cuffs ☐</td> <td>Contamination ☐</td> <td>Out of Sequence ☐</td> <td>Part Moved ☐</td> </tr> <tr> <td>Crushing ☐</td> <td>Countersink ☐</td> <td>Off-set ☐</td> <td>Drawing ☐</td> </tr> <tr> <td>Heat Treat ☐</td> <td>Cut Too Short ☐</td> <td>Mislabeled ☐</td> <td>☒ Finish</td> </tr> <tr> <td>Wave/Twist in Tube ☐</td> <td>Instructions Incomplete/Unclear ☐</td> <td>Fit/Function ☐</td> <td>Misread ☐</td> </tr> <tr> <td>Marks/Chatter ☐</td> <td>Drill Holes ☐</td> <td>Misaligned/off center ☐</td> <td>Turning Sequence ☐</td> </tr> </table>				Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	☒ Finish	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐
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Work Order ID 138594

Tuesday, November 03, 2015 11:47:38 AM

138594

Page 2

Item ID: D4857-M

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Wiper Deflector

Start Date: 11/3/2015 Start Qty: 4.00

4

Cust Item ID:

Required Date: 11/3/2015 Req'd Qty: 4.00

4

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

120

QC5- Inspect part completeness to step on W/O

0.00

120

QC

Memo

0.00

Quality Control

(4)

DAS

38

9-89

NOV 26 2015

P.T.O.

130

Identify as per dwg & Stock Location CCF132 0.00***130***

Packaging

Memo

0.00

Packaging

4

NOV 27 2015

DAS
38
9-89

140

QC21- Final Inspection - Work Order Release

0.00

140

QC

Memo

0.01

Quality Control

MCS

15-11-27

MCS

15-11-27

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY			
Environment ☐		No Re-verification ☐		Pressure/Forced ☐		Temperature/Cure ☐	
Design ☐		Operator ☐		Bending ☐		Set-up ☐	
Doc/Data ☐		Offset/Setup ☐		Centre Not Concentric ☐		BOM/Route ☐	
Equip/Tooling ☐		Supplier ☐		Cracks ☐		Broken/Damage/Defect ☐	
Handling/Pre ☐		Training ☐		Crimp/Kink/Ripple/Wave ☐		Inspection Incomplete/Unqualified ☐	
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Substation ☐		Process Improvement ☐		Marks/Chatter ☐		Drill Holes ☐	
Past Expiry Date ☐		Manufacturing Process ☐		OTHER : ☐			
Misidentified ☐		Past Due ☐					

Picklist Print

Tuesday, November 03, 2015 11:47:42 AM

Page 1

Work Order ID: 138594

138594

Parent Item: D4857-M

D4857-M

Parent Item Name: Wiper Deflector

Start Date: 11/3/2015

Required Date: 11/3/2015

Start Qty: 4.00

Required Qty: 4.00

Comments: IPP REV:A 14.05.21 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D4857-P		Purchased	No				Each	0.0000		4			
D4857-P													
Wiper Deflector													

4x SP15-11-26

DQA: _____ Date: _____



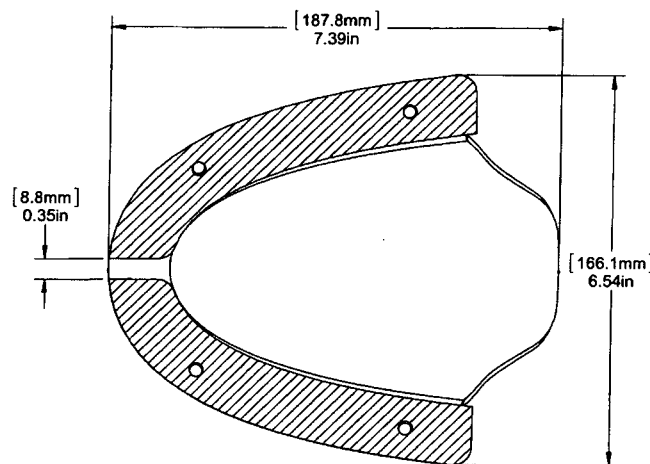
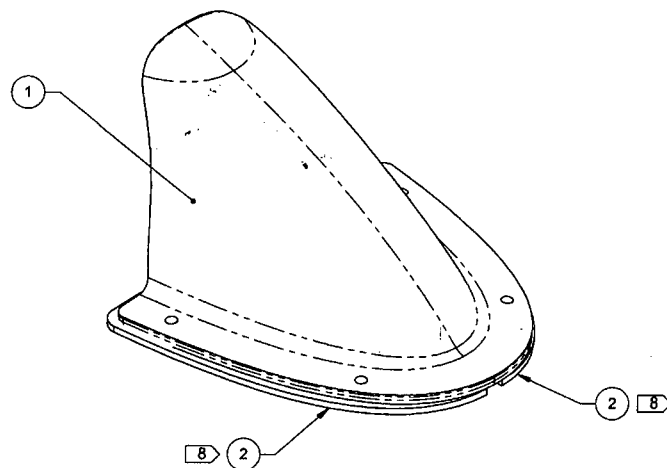
WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐							
		OTHER : ☐							

ITEM	QTY -041	P/N	DESCRIPTION
	X	D4857-041	WIPER DEFLECTOR ASSY
1	1	D4857-1	WIPER DEFLECTOR
2	2	D4944-1	GASKET



D4857-041 WIPER DEFLECTOR ASSY Δ

RELEASED

2015 JUN 08

ECN 15-582 CM

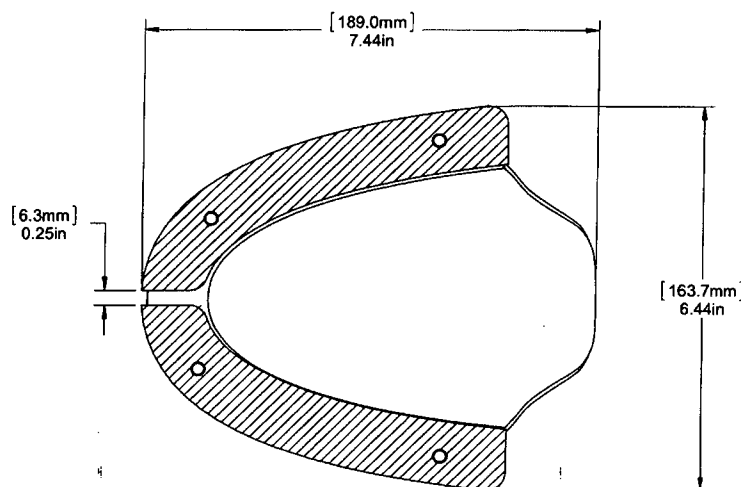
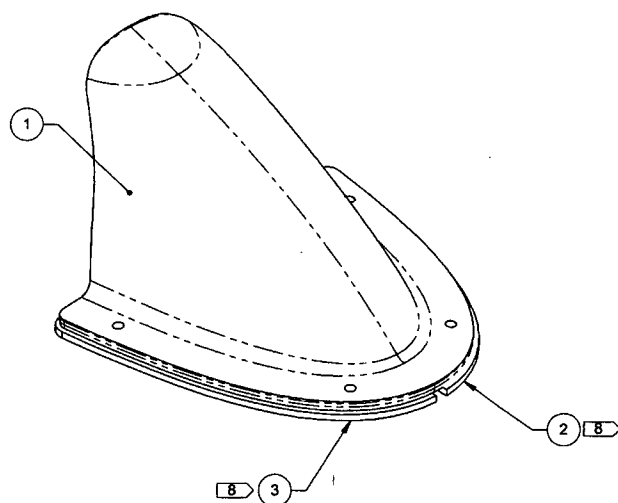
NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED, ALL METRIC DIMENSIONS ARE REFERENCE DIMENSIONS.
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D4857-041, REVISION, BATCH NUMBER, AND DATE OF MANUFACTURE, AS PER QSI 044 METHOD 6.1
- 7) WEIGHT: 0.38 lbs (0.17 kg)
- 8) BOND D4944-1 GASKETS TO EDGE OF PART USING DOW CORNING 736 ADHESIVE

F	SHT 1 ADDED -041. ADDED D4857-2M (SHEET 8) AND RELABELED D4857-M TO D4857-1M (ZN B5-7). UPDATED D4757-044 (ZN B5-3). REVISED NOTES 1, 8 AND 10 (ZN A8-4, ZN A8-5, ZN A8-6, ZN A8-7, ZN A8-8). UPDATE PART WEIGHTS	AK / AJS	15.06.03
E	REVISE NOTE 6) (ZN A8-1, A8-2, A8-3); AND NOTE 8) (ZN A8-1, A8-2, A8-3)	AK	14.06.05
D	ADDED D4857-043 (ZN C7-1), D4857-044 (ZN C7-2), D4857-3 (ZN C7-4), D4857-4 (ZN C7-5) AND D4857-M (ZN C7-6)	AK	14.05.13
C	ADDED 4 MOUNTING HOLES	DW	13.12.09
B	REVISED BOM, DRAWING VIEWS, NOTES	PB	13.08.13
A	NEW RELEASE	DB	13.05.23
REV.	DESCRIPTION	BY	DATE
DESIGN	DW	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AJS		
CHECKED	CP	DRAWING NO.	REV. F
MFG. APPR.	DD	D4857	SHEET 1 OF 8
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	WIPER DEFLECTOR	NTS
DATE	15.06.03	COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

APPROVED

ITEM	QTY -043	P/N	DESCRIPTION
	X	D4857-043	WIPER DEFLECTOR ASSEMBLY, LH
1	1	D4857-3	WIPER DEFLECTOR LH
2	1	D5117-1	GASKET
3	1	D5117-3	GASKET



D4857-043 WIPER DEFLECTOR ASSEMBLY, LH

RELEASED

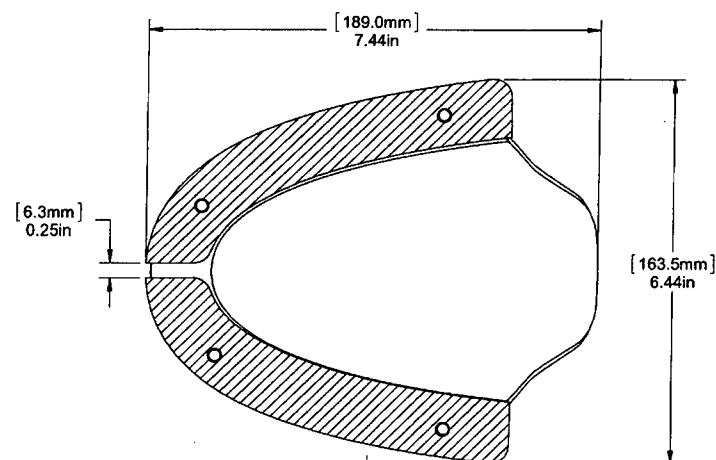
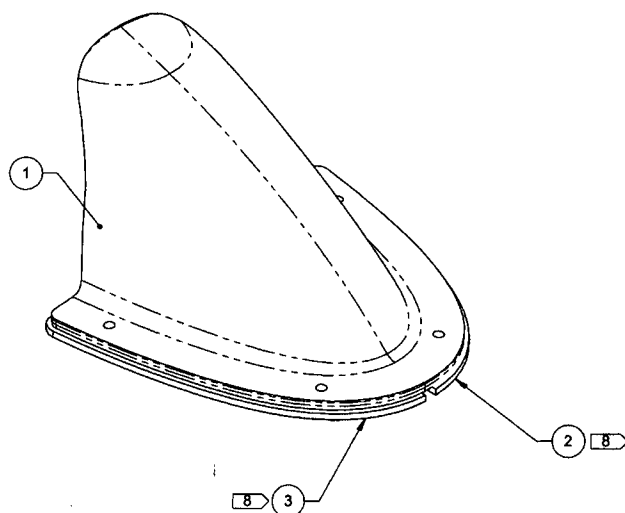
2015 JUN 08

NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED, ALL METRIC DIMENSIONS ARE REFERENCE DIMENSIONS.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D4857-043, REVISION, BATCH NUMBER, AND DATE OF MANUFACTURE, AS PER QSI 044 METHOD 6.1
- 7) WEIGHT: 0.38 lbs (0.17 kg)
- 8) BOND D5117-1/3 GASKETS TO EDGE OF PART USING DOW CORNING 736 ADHESIVE

APPROVED	DESIGN		DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
	DRAWN	AJS		
	CHECKED	CP	DRAWING NO.	REV. F
	MFG. APPR.	DD	D4857	SHEET 2 OF 8
	APPROVED	WM	TITLE	SCALE
	DE APPR.	DS	WIPER DEFLECTOR	NTS
DATE		15.06.03	COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS PROPRIETARY AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	

ITEM	QTY -044	P/N	DESCRIPTION
	X	D4857-044	WIPER DEFLECTOR ASSEMBLY, RH
1	1	D4857-4	WIPER DEFLECTOR
2	1	D5117-5	GASKET
3	1	D5117-7	GASKET



D4857-044 WIPER DEFLECTOR ASSEMBLY, RH

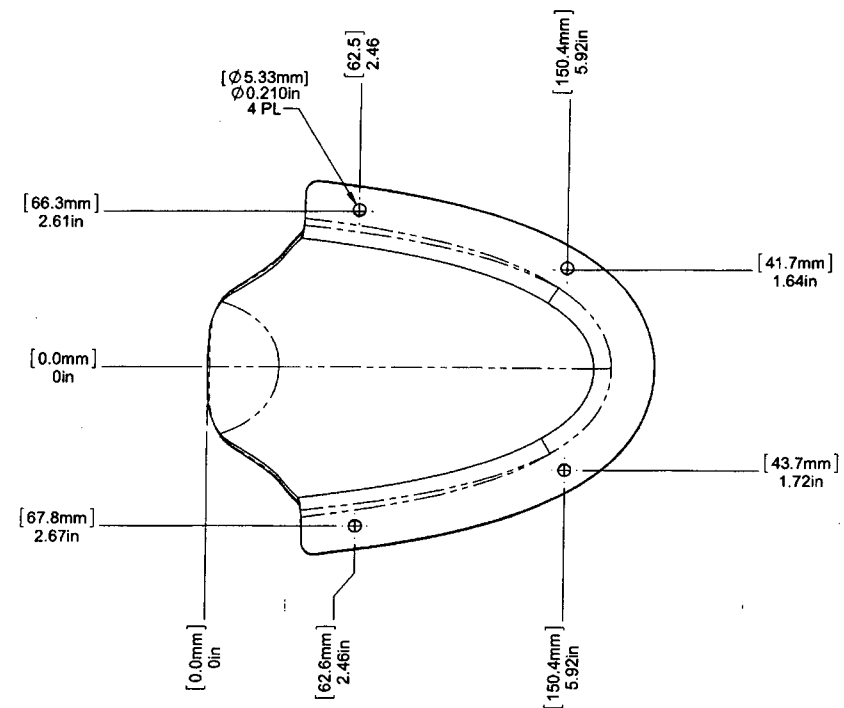
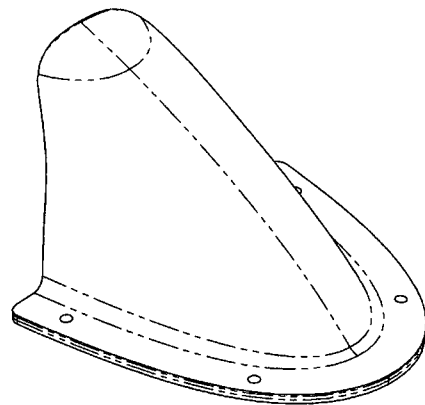
RELEASED

2015 JUN 08

NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED, ALL METRIC DIMENSIONS ARE REFERENCE DIMENSIONS.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D4857-044, REVISION, BATCH NUMBER, AND DATE OF MANUFACTURE, AS PER QSI 044 METHOD 6.1
- 7) WEIGHT: 0.38 lbs (0.17 kg)
- 8) BOND D5117-5/-7 GASKETS TO EDGE OF PART USING DOW CORNING 736 ADHESIVE

APPROVED	DESIGN	DW	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
	DRAWN	AJS		
	CHECKED	CP	DRAWING NO.	REV. F
	MFG. APPR.	DD	D4857	SHEET 3 OF 8
	APPROVED	WM	TITLE	SCALE
	DE APPR.	DS	WIPER DEFLECTOR	NTS
DATE		15.06.03	COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



D4857-1 WIPER DEFLECTOR

RELEASED

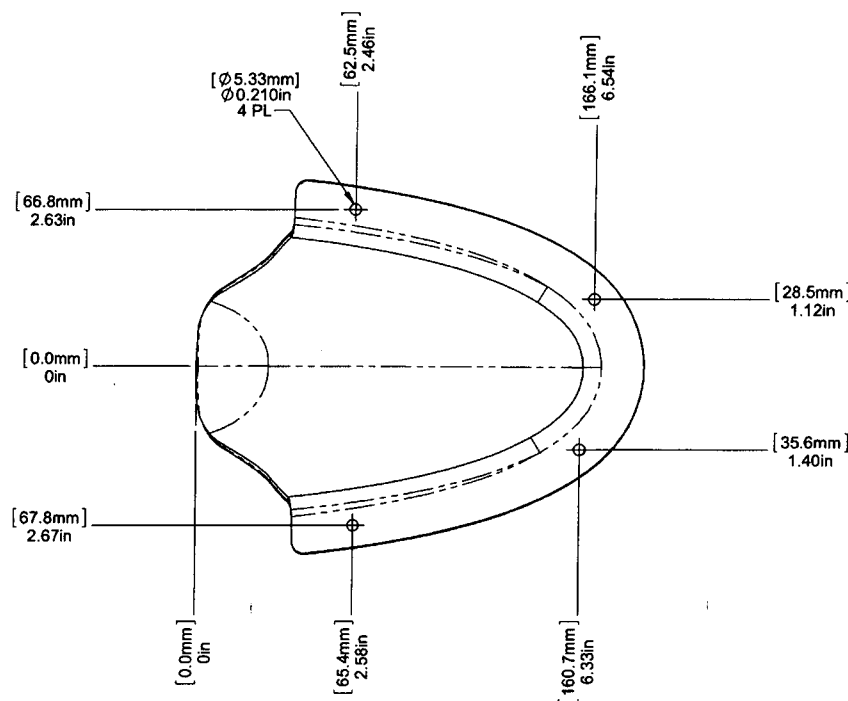
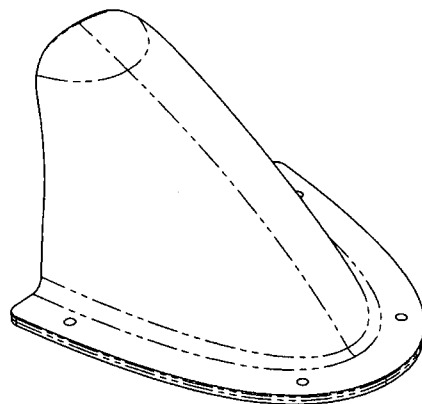
2015 JUN 08

NOTES:

- 1) MATERIAL: MADE FROM D4857-M
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED, ALL METRIC DIMENSIONS ARE REFERENCE DIMENSIONS.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.35 lbs (0.16 kg)
- 8) PART DIMENSIONS CONTROLLED BY CAD MODEL FILE D4857-1-F.IGES

APPROVED

DESIGN	DW	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AJS		
CHECKED	CP	DRAWING NO.	REV. F
MFG. APPR.	DD	D4857	SHEET 4 OF 8
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	WIPER DEFLECTOR	NTS
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D4857-3 WIPER DEFLECTOR, LH

RELEASED

2015 JUN 08

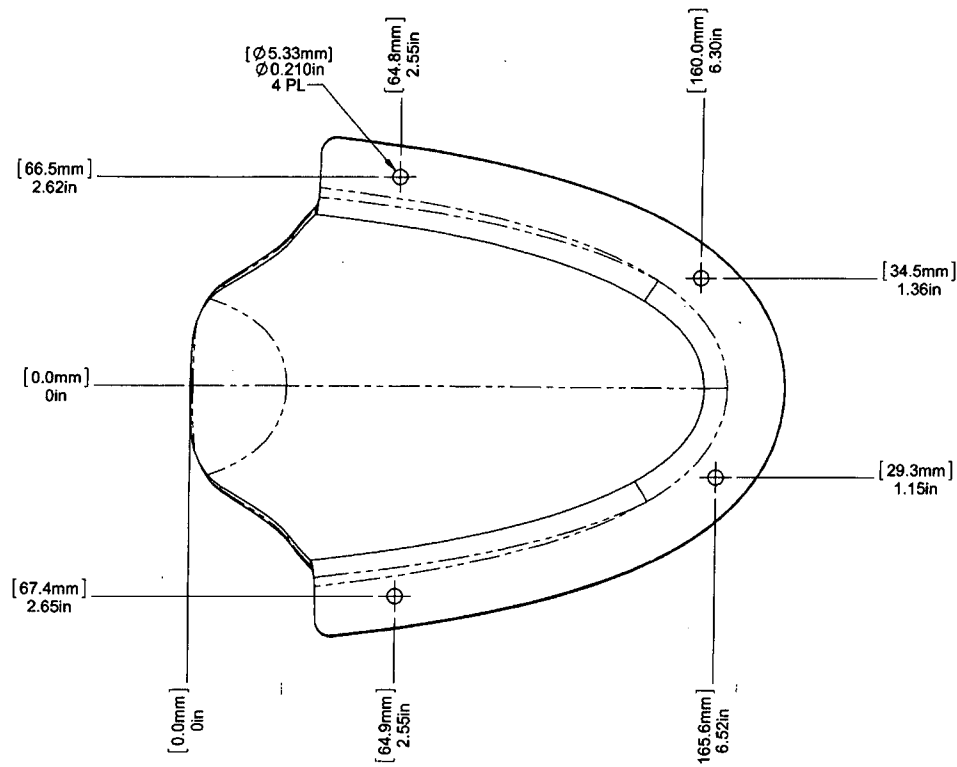
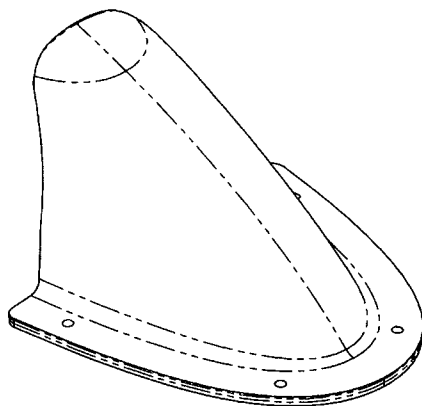
NOTES:

- 1) MATERIAL: MADE FROM D4857-M
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED, ALL METRIC DIMENSIONS ARE REFERENCE DIMENSIONS.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.35 lbs (0.16 kg)
- 8) PART DIMENSIONS CONTROLLED BY CAD MODEL FILE D4857-3-F.IGES



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DESIGN	DW	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AJS		
CHECKED	CP	DRAWING NO.	REV. F
MFG. APPR.	DD	D4857	SHEET 5 OF 8
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	WIPER DEFLECTOR	NTS
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D4857-4 WIPER DEFLECTOR, RH

RELEASED

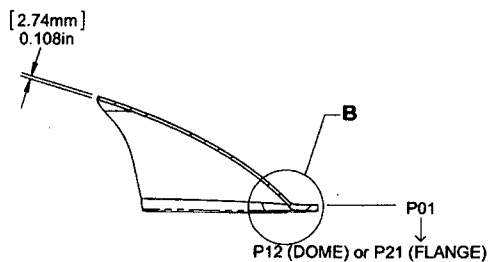
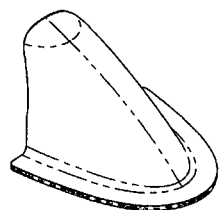
2015 JUN 08

NOTES:

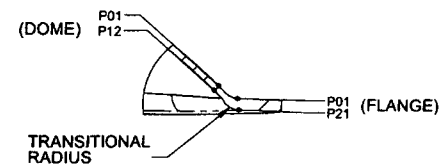
- 1) MATERIAL: MADE FROM D4857-M
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED, ALL METRIC DIMENSIONS ARE REFERENCE DIMENSIONS.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.35 lbs (0.16 kg)
- 8) PART DIMENSIONS CONTROLLED BY CAD MODEL FILE D4857-4-F.IGES

APPROVED

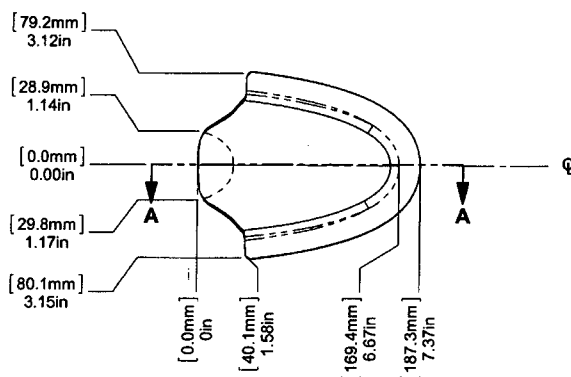
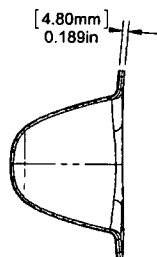
DESIGN	DW	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AJS		
CHECKED	CP	DRAWING NO.	REV. F
MFG. APPR.	DD	D4857	SHEET 6 OF 8
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	WIPER DEFLECTOR	NTS
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SECTION A-A



DETAIL B



D4857-M WIPER DEFLECTOR

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2015 JUN 08

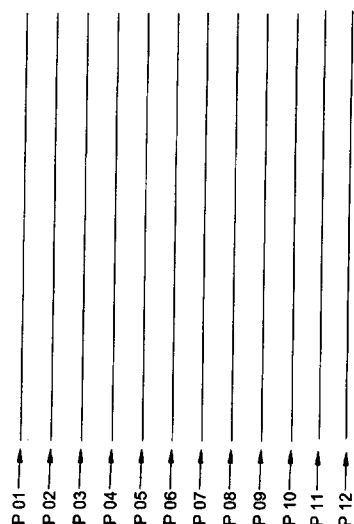
NOTES:

- 1 MATERIAL: KEVLAR #285/353 4H SATIN, EPOXY PREPREG, 250°F CURE, 40% R/C
- 2 MATERIAL: CARBON FIBER PREPREG, ALDILA PREPREG SYSTEM 3K2X2-FR250-204/40 T300,
- 3 MATERIAL: ALDILA #120 E-GLASS AR250 WITH 48% RC;
- 4 FINISH: PRIMER IAW MIL-P-85582, 2-7 MIL MAX.
- 5 TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 6 UNITS: INCHES UNLESS OTHERWISE NOTED, ALL METRIC DIMENSIONS ARE REFERENCE DIMENSIONS.
- 7 BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 8 IDENTIFICATION: N/A
- 9 WEIGHT: 0.35 lbs (0.16 kg)
- 10 PART DIMENSIONS CONTROLLED BY CAD MODEL FILE D4857-M-F.IGES
- 11 SEE SHEET 8 FOR LAYUP SCHEDULE. MANUFACTURE IAW MPP 145. CURE 250°F FOR 4 HOURS.

APPROVED

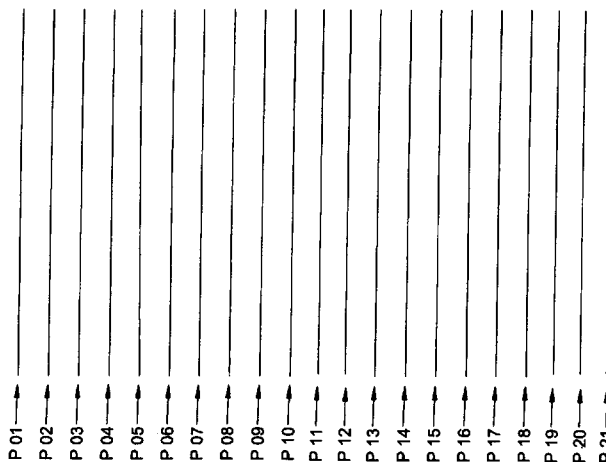
DESIGN	DW	DART AEROSPACE LTD	
DRAWN	AJS	HAWKESBURY, ONTARIO, CANADA	
CHECKED	CP	DRAWING NO.	REV. F
MFG. APPR.	DD	D4857	SHEET 7 OF 8
APPROVED	WM	TITLE	SCALE
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8 7 6 5 4 3 2 1



LAYUP OF LAYERS (DOME)

LAMINATE - .108in (12 LAYERS)			
PLY	WARP ANGLE	MATERIAL	THICKNESS
01	90	[1]	.008-.010
02	0	[1]	.008-.010
03	90	[2]	.008-.010
04	0	[2]	.008-.010
05	90	[2]	.008-.010
06	0	[2]	.008-.010
07	90	[2]	.008-.010
08	0	[2]	.008-.010
09	90	[2]	.008-.010
10	0	[2]	.008-.010
11	90	[2]	.008-.010
12	0	[2]	.008-.010



LAYUP OF LAYERS (FLANGE)

LAMINATE - .189in (21 LAYERS)			
PLY	WARP ANGLE	MATERIAL	THICKNESS
01	90	[1]	.008-.010
02	0	[1]	.008-.010
03	90	[2]	.008-.010
04	0	[2]	.008-.010
05	90	[2]	.008-.010
06	0	[2]	.008-.010
07	90	[2]	.008-.010
08	0	[2]	.008-.010
09	90	[2]	.008-.010
10	0	[2]	.008-.010
11	90	[2]	.008-.010
12	0	[2]	.008-.010
13	90	[2]	.008-.010
14	0	[2]	.008-.010
15	90	[2]	.008-.010
16	0	[2]	.008-.010
17	90	[2]	.008-.010
18	0	[2]	.008-.010
19	90	[2]	.008-.010
20	0	[2]	.008-.010
21	90	[3]	.005

RELEASED

2015 JUN 08 *DL*

APPROVED

DESIGN	DW	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AJS		
CHECKED	CP	DRAWING NO.	REV. F
MFG. APPR.	DD	D4857	SHEET 8 OF 8
APPROVED	WM	TITLE	SCALE
DE APPR.	DS #	WIPER DEFLECTOR	NTS
DATE 15.06.03		COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO30359**

Purchase Order Date 11/4/2015

PO Print Date 11/4/2015

Page Number 1 of 2

Order From :

VU-CBD001

Ship To : DART AEROSPACE LTD

CARBON BY DESIGN
4128 AVENIDA DE LA PLATA
OCEANSIDE, CALIFORNIA 92056
USA

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

FAKED

Contact Name

Vendor Phone 760-643-1300

Buyer

Chantal Lavoie

Customer POID

Customer Tax #

10127-2607

Ship To Contact

Terms

Net 30

Ship To Phone

Currency

USD

Ship Via:

FedEx Overnight collect

FOB

FCA - (Free Carrier)

Ship Acct:

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
1	D4857-P ✓ AS PER DWG D4857 REV. F B138594	Wiper Deflector	11/26/2015 Yes 11/26/2015	FN	4.00 ✓ Each	\$695.00	\$2,780.00
Line Total:							\$2,780.00
2	71401-45 Procurement Quality Clauses A004 faa-pma/tso A005 right of entry A016 personnel qualification A025 certification of conformance A040 notification of quality escape A041 quality management A042 dart noyification by supplier A043 retention of quality documents	PROCUREMENT QUALITY CLAUSES	11/26/2015 No 11/26/2015		1.00 ✓	\$0.00	\$0.00

2015-11-26

PO Instructions: Fedex Acc#151793240

Note:

11/4/2015



carbon by design

4128 Avenida De La Plata - Oceanside, CA 92056

Phone: 760-643-1300 Fax: 760-643-1333

www.carbonbydesign.com

Packaging List

Date: 11/25/2015

Packaging List No. 18868

Cage Code: 4DG17

CBD Work Order No. 9053

Customer PO No.: PO30359

Billing Address:

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
FedEx # 151793240

Please Deliver To:

Dart Aerospace LTD
1270 Aberdeen
Hawkesbury, ON K6A 1K7
Canada

Customer Phone	Terms	Rep	Ship Date	Ship Via
613-632-5200	Net 30	JB	11/25/2015	FedEx Next Day

Item	Line #	Description	Qty	U/M
120.2083	1	D4857-M, Dart Wiper Deflector S/N: 18868-1/18868-4	4	ea
SP15-11-24				

Thank you for your business.

Total Items: 4

SHIPPING VALUE

\$2,780.00

CERTIFICATE OF CONFORMANCE (SHORT FORM CUSTOMERS ONLY)

I certify that on _____, the Carbon by Design LP furnished the supplies or services called for by the Purchase Order Above via Delivery in accordance with all applicable requirements.

I further certify that the supplies or services are of the quality specified and conform in all respects with the contract requirements, including specifications, drawings, preservation, packaging, packing, marking requirements, and physical item identification, and are in the quantity shown in this or on the attached acceptance document.

Quality: _____

Date: _____

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carbon by design

4128 Avenida De La Plata, Oceanside, CA 92056
Phone: 760-643-1300 Fax: 760-643-1333

www.carbonbydesign.com

Invoice

Date: 11/25/2015

Invoice # 18868

PO. No.: PO30359

Sales Order#: 9053

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
FedEx # 151793240

Please Ship To:

Dart Aerospace LTD
1270 Aberdeen
Hawkesbury, ON K6A 1K7
Canada

Customer Phone	Terms	Rep	Ship Date	Ship Via	Account Status
613-632-5200	Net 30	JB	11/25/2015	FedEx Nex...	WW

Item	Line #	Qty	Description	U/M	Unit Price	Amount
120.2083	1	✓ 4	D4857-M, Dart Wiper Deflector S/N: 18868-1/18868-4	ea	695.00	2,780.00

2015-11-26

Thank you for your business.

Total \$2,780.00

All returns must be accompanied by a RMA #. Please call customer service at 760-643-1300 to receive a RMA number. Products damaged in shipment must be immediately documented and brought to the attention of Carbon by Design. Any products which have been installed/used are not subject to return. All returned Items, unless built to print, are subject to a 25% restocking fee. Canadian Customers are responsible for all brokerage fees, any fees not paid by the customer at the time of delivery are subject to further charges. No returns are accepted after 30 days.

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**carbon by design**

11/25/2015

CERTIFICATE OF CONFORMANCE

PO: No.: PO30359	Description: Wiper Deflector	Inspector: DR	Packing Slip #: 18868
Program Dart Aerospace	Drawing: D4857-P Rev F	Qty : 4	Serial Numbers: 18868-1/18868-4

Work Requirements:

Statement of Work: See Traveler
Internal Process Doc.: See Traveler
Inspection Document: See Traveler
Manufacturing Process: Prepreg- Trapped Rubber
Security Requirement: Confidential

Approved Non-Conformances:	NO	Pending SDR/ECN:	NO
Disposition:	To Customer, Ship	Shipping method:	FedEx Next Day

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Certification Statement: Carbon by Design LP certifies the items listed above conform to all of the applicable work and quality standard required in the purchase order listed above and any additional work requirements referenced.

All in process quality standards have been met according to customer requirements and Carbon by Design internal quality and finish requirements. All materials Certification are available for inspection and will remain on file at Carbon by Design for a period of no less than ten years.

Finished Materials/Process Specifications:

Per Drawing Requirements

Additional Quality Clauses:

Per PO Requirements, 100% Inspection

Active Quality Systems: AS 9100 Rev C, ISO9001:2008

Quality Control Representative	Title	Signature	Date
David Rodriguez	Quality Inspector	<i>David Rodriguez</i>	11/25/2015



carbon by design

STATISTICAL PROCESS DATA

NEW ITEM SET UP:

Customer

Dart

Rev

F

Nominal

0.35 LBS

High Limit

0

Low Limit

0

[illegible]



SUBJECT:
MANUFACTURING PROCESS PROCEDURE
MANUFACTURING COMPOSITE COMPONENTS

DOCUMENT NO:
MPP-145
Rev. A
02/27/15

APPENDIX B

Layup Schedule Record

Laminator-AA01

Laminator:	CHRIS LUGO
Location	CGD
Customer No.	PO30359
Product No.	D4857-M
Serial No.	18868-1
Classified	N/A

Serial Number-AA04

Unit Serial No.	18868-1
Roll Cert.	10480/9453/9312
QA Inspection	3

Environment-AA02

Lab No.	KILLER WHALE
Lamination Start Temp.	70 ☒ F ☐ C
Lamination Finish Temp.	75 ☒ F ☐ C
Humidity	0 ☒ rising ☐ falling
Date	11/16/15 ☒ lam 11/16/15 ☒ fin

Lamination-AA05

Resin System:	☒ epoxy ☐ vinyl ester ☐ polyester ☐ phenolic ☐ flex ☐ other		
Epoxy	☐ 574A ☐ 2932A ☐ 2110A ☒ Other	Hardener	☐ 734B ☐ 974B ☐ 8992B ☒ Other
Fiber Content	40 ⁺¹ / ₋₂ %	Type	☐ Cosmetic ☒ Structural ☐ Multi Load

3 11/03/15

Process-AA03

Process Type:	☐ open mold ☐ vac bag ☐ VARTM ☒ prepreg ☐ RTM ☐ HP Bladder		
Cure	☐ room heated ☒ oven ☐ autoclave	Tool	☐ soft carbon ☒ aluminum ☐ REN ☐ Foam
Cure Temp	200 ☒ F ☐ C	P.C. Temp	200 ☒ F ☐ C
Cure Time	4 hrs	P.C. Time	4 hrs
Release	☐ wax ☒ semi-perm	Degas	☒ yes ☐ no



SUBJECT:
MANUFACTURING PROCESS PROCEDURE
MANUFACTURING COMPOSITE COMPONENTS

DOCUMENT NO:
MPP-145
Rev. A
02/27/15

APPENDIX B

Layup Schedule Record

Laminator-AA01

Laminator:	CHRIS LUGO
Location	CBD
Customer No.	P030359
Product No.	D4857-M
Serial No.	18868-2
Classified	N/A

Serial Number-AA04

Unit Serial No.	18868-2
Roll Cert.	10480/9453/9312
QA Inspection	3

Environment-AA02

Lab No.	KILLER WHALE
Lamination Start Temp.	71 °F °C
Lamination Finish Temp.	74 °F °C
Humidity	0 rising falling
Date	11/17/15 lam 11/17/15 fin

Lamination-AA05

Resin System	☒ epoxy ☐ vinyl ester ☐ polyester ☐ phenolic ☐ fiber ☐ other		
Epoxy	☐ 574A ☐ 2932A ☐ 2110A ☒ Other	Hardener	☐ 734B ☐ 974B ☐ 8992B ☒ Other
Fiber Content	40+/-2%	Type	☐ Cosmetic ☒ Structural ☐ Multi Load

Process-AA03

Process Type:	☐ open mold ☐ vac bag ☐ VARTM ☒ prepreg ☐ RTM ☐ HP Bladder		
Cure	☐ room ☒ heated oven ☐ autoclave	Tool	☐ soft ☐ carbon ☒ aluminum ☐ REN ☐ Foam
Cure Temp	260 °F °C	P.C. Temp	260 °F °C
Cure Time	4 hrs	P.C. Time	4 hrs
Release	☐ wax ☒ semi-perm	Degas	☒ yes ☐ no



SUBJECT:
MANUFACTURING PROCESS PROCEDURE
MANUFACTURING COMPOSITE COMPONENTS

DOCUMENT NO:
MPP-145
Rev. A
02/27/15

APPENDIX B

Layup Schedule Record

Laminator-AA01

Laminator	CHAS LUGO
Location	CBD
Customer No.	P030359
Product No.	D4857-M
Serial No.	18868-3
Classified	N/A

Serial Number-AA04

Unit Serial No.	18868-3
Roll Cert.	10486/9453/9312
QA Inspection	3

Environment-AA02

Lab No.	KILLER WARE		
Lamination Start Temp.	71	☒ °F ☐ °C	
Lamination Finish Temp.	73	☒ °F ☐ °C	
Humidity	0	☒ rising ☐ falling	
Date	11/18/15	☒ lam ☐ fin	

Lamination-AA05

Resin System	☒ epoxy ☐ vinyl ester ☐ polyester ☐ phenolic ☐ flex ☐ other		
Epoxy	☐ 574A ☐ 2932A ☐ 2110A ☒ Other	Hardener	☐ 734B ☐ 974B ☐ 8992B ☒ Other
Fiber Content	40 ⁺ -2%	Type	☐ Cosmetic ☒ Structural ☐ Multi Load

3 11/23/15

Process-AA03

Process Type	☐ open mold ☐ vac bag ☐ VARTM ☒ prepreg ☐ RTM ☐ HP Bladder		
Cure	☐ room ☒ heated oven ☐ autoclave	Tool	☐ soft ☐ carbon ☒ aluminum ☐ REN ☐ Foam
Cure Temp	260 ☒ °F ☐ °C	P.C. Temp	260 ☒ °F ☐ °C
Cure Time	4 HRS	P.C. Time	4 HRS
Release	☐ wax ☒ semi-perm	Degas	☒ yes ☐ no



SUBJECT:
MANUFACTURING PROCESS PROCEDURE
MANUFACTURING COMPOSITE COMPONENTS

DOCUMENT NO:
MPP-145
Rev. A
02/27/15

APPENDIX B

Layup Schedule Record

Laminator-AA01

Laminator	CARIS LUGO
Location	CBD
Customer No.	P030359
Product No.	D4857-M
Serial No.	18868-4
Classified	N/A

Serial Number-AA04

Unit Serial No.	18868-4
Roll Cert.	10480/9455/9312
QA Inspection	J

Environment-AA02

Lab No.	KILLER WARE		
Lamination Start Temp.	71	☒ °F ☐ °C	
Lamination Finish Temp.	75	☒ °F ☐ °C	
Humidity	0	☒ rising ☐ falling	
Date	11/19/15	☒ lam ☐ fin	

Lamination-AA05

Resin System	☒ epoxy ☐ vinyl ester ☐ polyester ☐ phenolic ☐ urea ☐ other		
Epoxy	☐ 574A ☐ 2932A ☐ 2110A ☒ Other	Hardener	☐ 734B ☐ 974B ☐ 8992B ☒ Other
Fiber Content	40 ⁺ -2%	Type	☐ Cosmetic ☒ Structural ☐ Multi Load

J 11/23/15

Process-AA03

Process Type	☐ open mold ☐ vac bag ☐ VARTM ☒ prepreg ☐ RTM ☐ HP Bladder		
Cure	☐ room ☐ heated oven ☒ autoclave	Tool	☐ soft ☐ carbon ☒ aluminum ☐ REN ☐ Foam
Cure Temp	260 ☒ °F ☐ °C	P.C. Temp	260 ☒ °F ☐ °C
Cure Time	4 HRS	P.C. Time	4 HRS
Release	☐ wax ☒ semi-perm	Degas	☒ yes ☐ no

DART

AEROSPACE

SUBJECT:
MANUFACTURING PROCESS PROCEDURE
MANUFACTURING COMPOSITE COMPONENTS

DOCUMENT NO:
MPP-145
Rev. A
02/27/15

Laminate #1

Appendix B – Layup Schedule Record

LAYER 1	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°	LAYER 7	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 2	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 8	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 3	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 9	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☐ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 4	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 10	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 5	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 11	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☐ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 6	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 12	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre



SUBJECT:
MANUFACTURING PROCESS PROCEDURE
MANUFACTURING COMPOSITE COMPONENTS

DOCUMENT NO:
MPP-145
Rev. A
02/27/15

Laminates # 2
Appendix B – Layup Schedule Record

LAYER 1	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°	LAYER 7	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 2	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°	LAYER 8	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 3	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°	LAYER 9	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 4	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°	LAYER 10	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 5	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°	LAYER 11	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 6	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°	LAYER 12	☒ Carbon ☒ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°
	☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre



SUBJECT:
MANUFACTURING PROCESS PROCEDURE
MANUFACTURING COMPOSITE COMPONENTS

DOCUMENT NO:
MPP-145
Rev. A
02/27/15

Laminated #2

Appendix B – Layup Schedule Record

LAYER 13	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☒ 90° ☐ 45° ☐ -45°	LAYER 20	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°
	☒ Twill ☒ 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 14	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 21	☐ Carbon ☐ Kevlar ☐ S2 Glass ☒ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°
	☒ Twill ☒ 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☒ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 15	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 22	☐ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☐ 90° ☐ 45° ☐ -45°
	☒ Twill ☒ 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☐ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☐ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 16	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 23	☐ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☐ 90° ☐ 45° ☐ -45°
	☒ Twill ☒ 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☐ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☐ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 17	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 24	☐ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☐ 90° ☐ 45° ☐ -45°
	☒ Twill ☒ 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☐ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☐ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 18	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 25	☐ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☐ 90° ☐ 45° ☐ -45°
	☒ Twill ☒ 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☐ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☐ pre ☐ dry ☐ pre ☐ dry ☐ pre
LAYER 19	☒ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☒ 0° ☐ 90° ☐ 45° ☐ -45°	LAYER 26	☐ Carbon ☐ Kevlar ☐ S2 Glass ☐ E Glass	<u>Material Size</u> x	☐ 0° ☐ 90° ☐ 45° ☐ -45°
	☒ Twill ☒ 2x2 ☐ Uni ☐ 5HS	☒ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☒ pre ☐ dry ☐ pre ☐ dry ☐ pre		☐ Twill 2x2 ☐ Uni ☐ 5HS	☐ 3k ☐ 12k ☐ 3k ☐ 12k ☐ 3k ☐ 12k	☐ dry ☐ pre ☐ dry ☐ pre ☐ dry ☐ pre

CERTIFICATE OF CONFORMANCE**- RECERTIFICATION -**

CUSTOMER: CARBON BY DESIGN

Purchase Order Number: 9453

Sales Order Number: 11688

Product: AX-4112-285-50" RC38

Description: High Toughness, Flame Retardant

Description (ctd): Epoxy Aramid Prepreg

Batch Number: 91

Recertification Date: 8/24/2015

Warranty Expiration Date: 11/24/2015

Date of Manufacture: 2/17/2015

Storage Temperature: 40°F or below

Sales Order Quantity: 100 yd

Production Quantity: 100 yd

Test Report

Test	Requirement	Result	Test Method
Weight/psf	0.056 +/- 0.003	0.057	ATS-001
Volatiles/%	Report	2.239	ATS-002
Gel Time/second	Report	243	ATS-003
Flow/%	Report	10.727	ATS-004
Resin Content/%	38 +/- 4	38.995	ATS-005

Production Standard	Requirement	Result	Test Method
Visual Inspection	Pass	Pass	ATS-013
Tack Level / Number	Medium / 3	Medium / 3	ATS-015
Nominal Core Diameter	6"	6"	ATS-013
Sides Coated	Two	Two	ATS-013
Color	Natural	Natural	ATS-013
Liner Configuration	White Paper / 2.5 mil Red Poly	White Paper / 2.5 mil Red Poly	ATS-013

This document certifies material supplied to this order to the following requirements:

Purchase order terms and conditions

Axiom Test Standards (where applicable)

All terms and conditions of the Purchase Order Agreement

Specifications as noted below

Specification(s):

Axiom Test Standard

Recertified in accordance with:

Axiom Materials Quality Procedure AQP-020

Customer Purchase Order No. Recertification

Sales Order No. 13545



Digitally signed

by Rob Lewis

Date:

2015.08.25

14:18:06 -07'00'

Signature of Authorized Agent

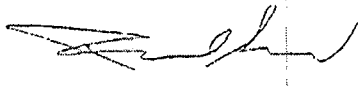
CERTIFICATE OF CONFORMANCE

Aldila Composite Materials hereby certifies that the materials or parts referenced below conform to all applicable requirements and specifications per the customer purchase order as noted. Any exception shall be itemized.

CUSTOMER	CARBON BY DESIGN
CUSTOMER PO NUMBER	10486
ACM SO NUMBER	501290
PRODUCT	3K2X2-FR250B-204/40 (2SP), 50"
CUSTOMER PART#	602.0001
ACM ITEM #	076903
BATCH	15-1170
ROLLS	1, 2
TOTAL QUANTITY	273 LFT, 1138 SF
MFG DATE	10/13/2015
SHIPMENT DATE	10/19/2015
WARRANTY	at 0°F FOR 6 MONTHS
EXPIRATION DATE	4/10/2016

QUALITY ASSURANCE REPRESENTATIVE:

NAME: FREDERICK F. SAREMI

SIGNATURE: 

DATE: 10/19/2015

PRC-DeSoto International, Inc.

PPG Aerospace - Deft
17451 VON KARMAN AVE, IRVINE,
CA 92614-6295
Phone No.: (800) 544-3338 or
(949) 474-0400

Certificate of Conformance

Pick List: P454476

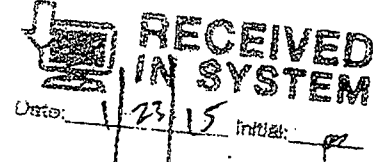
Dist No.: 771015
Bill-To: 771015B09
PRC ASC LOS ANGELES
Do not mail invoices:
aerospace_apinvoices@ppg.com
roxanne.rowe@ppg.com
CA 91342 USA
Phone: 818/549-7726
Ship-To: 7710150467
CARBON BY DESIGN
4128 AVENIDA DE LA PLATA
OCEANSIDE, CA 92056 USA
Phone:

Branch: BINT
Sales Order No.: S 7623
Total Cartons: .00

Customer P.O. LAD11085

Contract/Credit Auth
Number:

Mark For: FX ACCT# 573438523
CSR: JSR



Remarks:

Order Date	Ship Date	Terms	Freight Term	Freight	Service Key
01/20/2015	01/22/2015	Net 30 Days	Freight Collect	Fedex Freight	ValleryR
Line	Order Qty	Product	Description / Reference Number	DOM	Net Cartons
1	8	44GN098 1GK	MIL-PRF-85582E, TYPE I, CLASS N, 1-STEP MIX GALLON KIT LMA-MR003E TYPE II CLASS 2 GRADE A; 5PTMRT09C GRADE B: H MS 15-1100 TYPE I CLASS 2 GRADE N; PWA 36515C-3 and FMS 3027C FORM 3 P/N: DE44GN098XZZG2ST	EA	8
Customer PO: 9312			Lot Number: 102728/102729	8	<u>8</u>
DOM:		June 2014DOE: 6/2016		DOM of Repack:	DOE of Repack:
Total Cartons: .00					

Picked By:

Checked By:

1/21/2015

PPG Aerospace/PRC DeSoto International certifies that the above materials have been manufactured, tested and conforms to all requirements in accordance with applicable specifications. All test data pertaining to batch acceptance requirements defined by the specification for this material is on file and available for inspection upon request. For Non-US PPG Customers, we can only offer Technical Data/Test Reports for any ITAR or EAR restricted specifications with valid US export authorization

Christopher Tafel - Quality Assurance Specialist